NASA SBIR 2005 Phase I Solicitation

S8.06 Platform Power Management and Distribution

Lead Center: GRC

Participating Center(s): GSFC, JPL

NASA science missions employ Earth orbit and planetary spacecraft, along with terrestrial balloons, surface assets, aircraft, and marine craft as observation platforms. Advanced electrical power technologies are required for the electrical components and systems on these platforms to address the issues of size, mass, efficiency, capacity, durability, and reliability. Advancements are sought in power electronic devices, components, and packaging.

Power Electronic Materials and Components

Advanced magnetic, dielectric, and semiconductor materials, devices, and circuits are of interest. Proposals must address improvements in energy density, speed, efficiency, or wide temperature operation (-125°C to 200°C) with a high number of thermal cycles. Candidate devices and applications include transformers, inductors, semiconductor switches and diodes, electrostatic capacitors, current sensors, and cables.

Power Conversion, Motor Drive, Protection, and Distribution

Technologies that provide significant improvements in mass, size, power quality, reliability, or efficiency in electrical power conversion, motor drives, and protective switchgear components are of interest. Candidate applications include solar array regulators, battery charge and discharge regulators, power conversion, power distribution, fault protection, high-speed motors/generators, magnetic bearing drivers, and integrated flywheel energy storage and attitude control electronics.

Electrical Packaging

Thermal control technologies are sought that are integral to electrical devices with high heat flux capability and advanced electronic packaging technologies which reduce volume and mass or combine electromagnetic shielding with thermal control.